CLAIMS

1. A light-emitting diode characterized by comprising:

an electron implanting electrode, that is, an n-electrode;

a hole implanting electrode, that is, a p-electrode; and

an inorganic light-emitting layer which is disposed between the n-electrode and the p-electrode so as to contact these electrodes and which is formed of an ambipolar inorganic semiconductor material.

2. The light-emitting diode according to claim 1, characterized in that

in the ambipolar inorganic semiconductor material, a ratio of mobility between electrons and holes is in a range of 1/100 to 100.

3. The light-emitting diode according to claim 1, characterized in that

in the ambipolar inorganic semiconductor material, each mobility of the holes and the electrons at room temperature is 10^{-1} cm^2/Vs or more.

4. The light-emitting diode according to claim 1, characterized in that

the ambipolar inorganic semiconductor material has a dopant concentration of 0.1% or less.

5. The light-emitting diode according to claim 1, characterized in that

a thickness of the inorganic light-emitting layer is 10 nm or more and 10 μm or less.

6. The light-emitting diode according to any one of claims 1 to 5, characterized in that

the ambipolar inorganic semiconductor material has a group II-VI compound, or Zn and at least one element selected from the group consisting of S, Se and Te.

7. The light-emitting diode according to any one of claims 1 to 5, characterized in that

the ambipolar inorganic semiconductor material has a group III-V compound, or N and at least one element selected from the group consisting of Al, Ga and In.

8. The light-emitting diode according to any one of claims 1 to 5, characterized in that

the ambipolar inorganic semiconductor material includes, as the main component, carbon forming sp^3 hybrid orbitals.

9. The light-emitting diode according to any one of claims 1 to 8, characterized in that

the n-type electrode includes a layer formed by use of an n-type inorganic semiconductor material in which an n-type dopant is diffused into the ambipolar inorganic semiconductor material.

10. The light-emitting diode according to any one of claims 1 to 8, characterized in that

the p-type electrode includes a layer formed by use of a p-type inorganic semiconductor material in which a p-type dopant is diffused into the ambipolar inorganic semiconductor material.

11. The light-emitting diode according to any one of claims 1 to 8, characterized in that

the n-type electrode includes a layer formed by use of an n-type inorganic semiconductor material in which an n-type dopant is diffused into the ambipolar inorganic semiconductor material, and the p-type electrode includes a layer formed by use of a p-type inorganic semiconductor material in which a p-type dopant is diffused into the ambipolar inorganic semiconductor material.

12. The light-emitting diode according to any one of claims 1 to 8, characterized in that

a material of a portion contacting the light-emitting layer in at least one of the

n-type electrode and the p-type electrode is formed by use of a material substantially different from the material of the light-emitting layer.

13. The light-emitting diode according to any one of claims 1 to 12, characterized in that

an ambipolar inorganic semiconductor material is formed on a crystalline substrate or a glass substrate, and the n-electrode and the p-electrode are formed on the ambipolar inorganic semiconductor material so as not to contact each other.

14. The light-emitting diode according to any one of claims 1 to 12, characterized in that

the n-electrode or the p-electrode is formed on a crystalline substrate or a glass substrate, and an ambipolar inorganic semiconductor material is stacked thereon, and the p-electrode or the n-electrode is stacked thereon.